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EXAMINER

BERNATZ, KEVIN M

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 12/26/2002

3

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/828,635

Applicant(s)

SIN ET AL.

Examiner

Kevin M Bernatz

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

## DETAILED ACTION

### ***Examiner's Comments***

1. The examiner has interpreted the transitional phrase "adjoining" as open language given the disclosure in the dependent claims regarding adding additional nonmagnetic and ferromagnetic layers being added to the sensor structure.
2. The examiner has interpreted the antiferromagnetic layer as being required to be located on the exterior of the layered structure (see applicants' Figures), since the insertion of an antiferromagnetic layer between one of the ferromagnetic and nonmagnetic layers is not disclosed and is contrary to the teachings in the art.

### ***Specification***

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

***The abstract of the disclosure is now limited to 150 words or 15 lines (37 CFR 1.72). See MPEP § 608.01(b).***

The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The

Art Unit: 1773

disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 6, 7, 9 and 17 – 20 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims contain reference to a third non-magnetic layer and/or a fourth ferromagnetic layer, yet the specification never describes a fourth ferromagnetic layer being present.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 2 and 17 – 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 17 – 20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See

Art Unit: 1773

MPEP § 2172.01. The omitted structural cooperative relationships are: the relative locations of the ferromagnetic layers, ferromagnetic "portions", and the non-magnetic layers, since the term "distal" in the claims is vague and indefinite. The examiner is unable to determine the scope of the present claims (see below for definition of the word "distal" from the Meriam-Webster dictionary).

*Merriam-Webster definitions:*

*Main Entry: dis-tal*

*1 : situated away from the point of attachment or*

*origin or a central point especially of the body --*

*compare PROXIMAL*

The examiner recommends replacing the word "distal" with phrasing which more accurately defines the claimed invention.

### ***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1 – 7, 9 – 14 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Ooshima et al. (U.S. Patent App. Pub. 2001/0033466 A1).

Regarding claims 1 – 3, 11 and 14, Ooshima et al. disclose a sensor comprising: first (*Figure 5, element 63*), second (*element 60*) and third ferromagnetic layers (*element 7a*) that are interleaved with first (*element 59*) and second (*element 7c*) electrically conductive nonmagnetic layers (*Paragraphs 0229, 0237, 0238 and 0241*), said first nonmagnetic layer adjoining said first and second ferromagnetic layers (*elements 63/59/60*), said second nonmagnetic layer adjoining said second and third ferromagnetic layers (*elements 60/7c/7a*), said first and third ferromagnetic layers having magnetic moments with directions that are fixed in response to an applied magnetic field (*i.e. are “pinned” magnetic layers – see Figures 1 and 5; and Paragraphs 0085 – 0094, 0105, and 0226*), said second ferromagnetic layer having a free portion, said free portion having a magnetic moment with a direction that rotates in response to said applied magnetic field (*i.e. is a “free” magnetic layer – see Figures 1 and 5; and Paragraphs 0106 and 0226*), where said third ferromagnetic layer (*element 7a*) overlaps only a portion of said second ferromagnetic layer (*element 60*).

It has been held that where claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established and the burden of proof is shifted to applicant to show that prior art products do not necessarily or inherently possess characteristics of claimed products where the rejection is based on inherency under 35 USC 102 or on *prima facie* obviousness under 35 USC 103, jointly or alternatively. Therefore, the *prime facie* case can be rebutted by **evidence** showing that the prior art products do not

Art Unit: 1773

necessarily possess the characteristics of the claimed product. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). “When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.” *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

In the instant case, the disclosed prior art product is substantially identical in structure (*Figures 1 and 5*) to the claimed product (i.e. a spin valve sensor comprising a pinned magnetic layer, a free magnetic layer and another pinned magnetic layer broken into sections only extending over part of the free magnetic layer – See applicants’ Figure 3).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of:

the second ferromagnetic layer having a fixed portion, said fixed portion having a magnetic moment with a direction that does not rotate in response to said applied magnetic field (i.e. the definition of “pinning” and equivalent to claim 14 – “a magnetically stabilized portion”) and wherein said third ferromagnetic layer overlaps said fixed portion and does not overlap said free portion

would have inherently been present because the claimed and prior art products are substantially identical in structure, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Regarding claims 8 and 15, Ooshima et al. disclose non-magnetic layers meeting applicants' claimed limitations (*Paragraphs 0229, 0237, 0238 and 0241*).

Regarding claims 4, 5, 12 and 13, Ooshima et al. disclose antiferromagnetic layers meeting applicants' claimed limitations (*Figure 5, elements 2 and 6; and Paragraphs 0094 – 0097, 0200, and 0206*).

Regarding claims 6, 7 and 9, Ooshima et al. disclose fourth ferromagnetic layers (*element 7b*) and third non-magnetic layers (*element 166*) meeting applicants' claimed limitations.

Regarding claims 10 and 16, Ooshima et al. disclose magnetic moments meeting applicants' claimed limitations (*Figure 5, wherein the first ferromagnetic layer has magnetic moments into the page and the third ferromagnetic layer has magnetic moments along the page*).

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1 – 5, 10 – 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al. (U.S. Patent No. 5,991,125) in view of Hasegawa et al. (U.S. Patent No. 6,496,338 B2).



Regarding claims 1 – 3, 11 and 14, Iwasaki et al. disclose a sensor comprising: first (*Figure 21, element 16*), second (*element 11*) and third ferromagnetic layers (*element 13*) that are interleaved with first (*element 5*) and second (*element 12*) electrically conductive nonmagnetic layers (col. 10, lines 27 – 44 and lines 55 - 60), said first nonmagnetic layer adjoining said first and second ferromagnetic layers (*elements 14/5/11*), said second nonmagnetic layer adjoining said second and third ferromagnetic layers (*elements 11/12/13*), said first and third ferromagnetic layers having magnetic moments with directions that are fixed in response to an applied magnetic field (*i.e. are “pinned” magnetic layers – see Figure 21 and col. 15, line 61 bridging col. 16, line 4*), said second ferromagnetic layer having a free portion, said free portion having a magnetic moment with a direction that rotates in response to said applied magnetic field (*i.e. is a “free” magnetic layer – see Figure 21 col. 10, lines 27 - 44*).

Iwasaki et al. fail to disclose the third ferromagnetic layer overlapping only a portion of the second magnetic layer.

However, Hasegawa et al. teach forming a sensor wherein the bias element (*Figure 1, element 35*) only covers an exterior of the free magnetic layer (*element 34*) in order to suppress Barkhausen noise and to pin part of the free magnetic layer by exchange coupling (col. 1, line 56 bridging col. 2, line 47 and Figures 2 and 10).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Iwasaki et al. to form the layers above the free magnetic layer (*Iwasaki et al. - element 11*) such that they only over the outer portion of the free magnetic layer as taught by Hasegawa et al. in order to pin the

Art Unit: 1773

exterior part of the free magnetic layer via exchange coupling, thereby suppressing Barkhausen noise generation.

Regarding the limitations in the magnetization of the second ferromagnetic layer, the disclosed prior art product as taught by Iwasaki et al. in view of Hasegawa et al. is substantially identical in structure to the claimed product (i.e. a spin valve sensor comprising a pinned magnetic layer, a free magnetic layer and another pinned magnetic layer broken into sections only extending over part of the free magnetic layer – See applicants' Figure 3).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of:

the second ferromagnetic layer having a fixed portion, said fixed portion having a magnetic moment with a direction that does not rotate in response to said applied magnetic field (i.e. the definition of "pinning" and equivalent to claim 14 – "a magnetically stabilized portion") and wherein said third ferromagnetic layer overlaps said fixed portion and does not overlap said free portion

would have inherently been present because the claimed and prior art products are substantially identical in structure, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product (see also Figure 2 of Hasegawa et al., teaching a magnetic layer having three separate magnetization regions).

Art Unit: 1773

Regarding claims 4, 5, 12 and 13, Iwasaki et al. disclose antiferromagnetic layers meeting applicants' claimed limitations (*Figure 21, elements 14; col. 10, lines 36 – 38; and col. 15, line 42 bridging col. 16, line 6, which teaches that the NiFe and CoFe layers result in different blocking temperatures for the antiferromagnetic layers*).

Regarding claims 10 and 16, Iwasaki et al. disclose the equivalents of using a structure where the first and third ferromagnetic layers have magnetic moments meeting applicants' claimed limitations (*Figure 14B compared to Figures 21 and 22*).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, first and third ferromagnetic layers having perpendicular magnetic moments or opposite magnetic moments are equivalents in the field of multi-layered spin-valve sensors. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

12. Claims 6, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al. in view of Hasegawa et al. as applied above, and further in view of Ishikawa et al. (U.S. Patent No. 6,396,734 B2).

Regarding claims 6, 7 and 9, Iwasaki et al. in view of Hasegawa et al. are relied upon as described above.

Neither Iwasaki et al. nor Hasegawa et al. disclose a fourth ferromagnetic layer and third nonmagnetic layer meeting applicants' claimed limitations.

However, Ishikawa et al. teach that it is old in the art to substitute a single pinned layer with a synthetic pinned ferromagnetic layer comprising an additional ferromagnetic layer and non-magnetic layer in order to reduce the static magnetic field, thereby remedying the peak asymmetry of the read-back waveform of the head (col. 3, lines 9 – 24). Replacement of the pinned magnetic layer (*Iwasaki et al.*, *element 13*) with a ferromagnetic/non-magnetic/ferromagnetic synthetic pinned layer would meet applicants' claimed limitations.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Iwasaki et al. in view of Hasegawa et al. to utilize a synthetic pinned magnetic layer, thereby meeting applicants' claimed limitations, as taught by Ishikawa et al. in order to reduce the static magnetic field, thereby remedying the peak asymmetry of the read-back waveform of the head.

13. Claims 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al. in view of Hasegawa et al. as applied above, and further in view of Watanabe et al. (U.S. Patent No. 5,995,338).

Regarding claims 8 and 15, Iwasaki et al. in view of Hasegawa et al. are relied upon as described above.

Neither Iwasaki et al. nor Hasegawa et al. disclose a non-magnetic layer meeting applicants' claimed limitations.

However, the claimed elements are known equivalents to Cu (used by Iwasaki et al.), as taught by Watanabe et al. (col. 8, lines 33 – 37).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, Cu, Ru, Rh and Ir are equivalents in the field of nonmagnetic conductive elements for nonmagnetic conductive layers in sensors. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

14. Claims 1 – 4 and 10 – 12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (U.S. Patent No. 6,122,151) in view of Kurosawa et al. (U.S. Patent No. 5,910,868) and Watanabe et al. ('338).

Regarding claims 1 – 3, 11 and 14, Saito et al. disclose a sensor comprising: first (*Figure 3, element 2*), second (*element 4*) and third ferromagnetic layers (*element 10*) that are interleaved with first (*element 3*) electrically conductive nonmagnetic layer (col. 6, lines 15 - 18), said first nonmagnetic layer adjoining said first and second ferromagnetic layers (*elements 2/3/4*), wherein said third ferromagnetic layer overlaps only a portion of said second ferromagnetic layer.

Regarding the limitations in the magnetization of the second ferromagnetic layer, the disclosed prior art product as taught by Saito et al. is substantially identical in structure to the claimed product (i.e. a spin valve sensor comprising a lower antiferromagnetic layer (*element 1*), a pinned magnetic layer, a free magnetic layer, a second pinned magnetic layer and a biasing layer (*element 5*), wherein the second

Art Unit: 1773

pinned magnetic layer is broken into sections only extending over part of the free magnetic layer – See applicants' Figure 3).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of:

said first and third ferromagnetic layers having magnetic moments with directions that are fixed in response to an applied magnetic field (i.e. are "pinned" magnetic layers –col. 4, line 64 bridging col. 5, line 24), said second ferromagnetic layer having a fixed portion and a free portion, said free portion having a magnetic moment with a direction that rotates in response to said applied magnetic field (i.e. is a "free" magnetic layer –col. 8, line 60 bridging col. 9, line 39), said fixed portion having a magnetic moment with a direction that does not rotate in response to said applied magnetic field (i.e. the definition of "pinning" and equivalent to claim 14 – "a magnetically stabilized portion") and wherein said third ferromagnetic layer overlaps said fixed portion and does not overlap said free portion

would have inherently been present because the claimed and prior art products are substantially identical in structure, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product (see also col. 9, lines 11 - 22, teaching a free magnetic layer having three separate magnetization regions, depending on where the third ferromagnetic layer is formed).

While Saito et al. disclose a bias layer comprising a CoCr hard magnetic alloy, the examiner notes that antiferromagnetic bias layers are known equivalents and perform the same function (i.e. there is sound basis for the inherency of the properties above even though applicants use an antiferromagnetic bias layer and Saito et al. use a CoCr hard magnetic bias layer). See Watanabe et al. ('338) for support that these materials are known equivalents for bias layers (*col. 9, lines 54 - 55 and col. 18, lines 20 - 27: "the same effect can be obtained when ... an antiferromagnetic thin film having a body-centered cubic lattice structure is used"*).

Neither Saito et al. nor Watanabe et al. disclose a second nonmagnetic layer meeting applicants' claimed limitations.

However, Kurosawa et al. teach forming a sensor where a nonmagnetic layer is inserted directly below a ferromagnetic/antiferromagnetic layer structure (*i.e. Saito et al., elements 5 and 10*) in order to improve the Hua of the antiferromagnetic layer (*col. 3, lines 3 - 13 and lines 63 - 65*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Saito et al. in view of Watanabe et al. to form a non-magnetic layer between the second and third ferromagnetic layers in order to improve the Hua of the antiferromagnetic layer deposited on the third ferromagnetic layer.

Regarding claims 4 and 12, Saito et al. disclose antiferromagnetic layers meeting applicants' claimed limitations (*col. 5, lines 65 - 67 and Figure 3, element 1*).

Regarding claims 10 and 16, Saito et al. disclose ferromagnetic layers having magnetization states meeting applicants' claimed limitations (col. 5, lines 1 – 8).

15. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. in view of Kurosawa et al. and Watanabe et al. as applied above (hereafter this combination of references will be referred to as SKW et al.), and further in view of Hasegawa et al. ('338).

SKW et al. are relied upon as described above.

None of SWK et al. teach antiferromagnetic layers meeting applicants' claimed blocking temperature limitations.

However, Hasegawa et al. teach a spin valve sensor comprising an upper and lower antiferromagnetic layer wherein the two layers are taught to be unique from each other in composition, and hence, blocking temperature in order to produce a sensor having excellent corrosion resistance, linear response and requiring no special heat treating equipment (col. 5, lines 50 – 67; col. 7, lines 3 – 53; *col. 9, lines 31 – 34; and Figure 1, elements 31 and 35*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of SKW et al. to use antiferromagnetic layers meeting applicants' claimed limitations as taught by Hasegawa et al. in order to produce a sensor having excellent corrosion resistance, linear response and requiring no special heat treating equipment.



Art Unit: 1773

16. Claims 6, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over SKW et al. as applied above, and further in view of Ishikawa et al. ('734).

SKW et al. are relied upon as described above.

None of SKW et al. disclose a fourth ferromagnetic layer and third nonmagnetic layer meeting applicants' claimed limitations.

However, Ishikawa et al. teach that it is old in the art to substitute a single pinned layer with a synthetic pinned ferromagnetic layer comprising an additional ferromagnetic layer and non-magnetic layer in order to reduce the static magnetic field, thereby remedying the peak asymmetry of the read-back waveform of the head (col. 3, lines 9 – 24). Replacement of the pinned magnetic layer (*Saito et al.*, *element 10*) with a ferromagnetic/non-magnetic/ferromagnetic synthetic pinned layer would meet applicants' claimed limitations.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of SKW et al. to utilize a synthetic pinned magnetic layer, thereby meeting applicants' claimed limitations, as taught by Ishikawa et al. in order to reduce the static magnetic field, thereby remedying the peak asymmetry of the read-back waveform of the head.

### **Conclusion**

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

Art Unit: 1773

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.



KMB  
December 23, 2002



Paul Thibodeau  
Supervisory Patent Examiner  
Technology Center 1700